VOL. VII. No. 12. JUNE 9, 1910

THE JOURNAL OF PHILOSOPHY
PSYCHOLOGY AND SCIENTIFIC METHODS

THE SCIENCE AND PHILOSOPHY OF THE ORGANISM[1]

THOSE who wish to gain some insight into the biological philosophy known as "vitalism," or at least to become acquainted with the maturer views of one of its leading exponents, will find the present volumes of the greatest service. To English and American students, in particular, it will be a boon to have at last a presentation of Driesch's views in the English language. Most readers will probably find it sufficiently difficult to follow this writer's rather devious trains of thought, even without the added obstacle imposed by a foreign idiom. And we may regard it as a hopeful sign of the times that the number of these readers appears to be considerable.[2] It is surely a subject for congratulation when our working biologists are willing to pause in their labors long enough to make such a wide excursion into philosophy, especially when this particular brand of philosophy stands in flat contradiction to some of their most cherished dogmas. It is not uncommon to hear any effort of the scientific imagination dismissed with the contemptuous epithet of "metaphysics." But problems there are which force themselves upon our attention even though they baffle us, and any sincere attempt to face such problems certainly deserves praise. All this we may say without agreeing with any particular solution which may be offered us.

One of these volumes of Driesch's, comprising the first half of his Gifford lecture course, has already been reviewed in this JOURNAL by Professor T. H. Morgan.[3] I have not found it possible, however, to deal with the second volume independently of the first, and accordingly I shall here consider the work as a whole. This procedure seems all the more allowable since the point of view of the two

[1] The Gifford Lectures delivered before the University of Aberdeen in the years 1907 and 1908. By Hans Driesch. London: Adam and Charles Black, 1908. Vol. I., pp. xiii + 329; Vol. II., pp. xvi + 381.

[2] To the knowledge of the reviewer this work has already been used as the basis of "seminar" courses in the zoological departments of two of our leading universities.

[3] This JOURNAL, Vol. VI., No. 4.

reviewers differs sufficiently to render unlikely any considerable duplication of thought.

The work as a whole is divided into two sections, which do not, however, correspond with the division into volumes. Section A presents The Chief Results of Analytical Biology, while Section B discusses The Philosophy of the Organism. The first section comprises Part I., The Individual Organism with Regard to Form and Metabolism; Part II., Systematics and History, and Part III., Organic Movements. The second section comprises I., The Indirect Justification of Entelechy; II., The Direct Justification of Entelechy; III., The Problem of Universal Teleology, and IV., Metaphysical Conclusions. The further division of the work into subsections of various grades is altogether too intricate to be kept in mind by the reader, and we can not see that it serves any useful purpose whatever.

In Section A we meet with such biological data as the author offers in support of his thesis, and here it is, also, that we find his three "proofs" of vitalism. In commencing Section B, however, we part company with concrete reality, and wander through a rather bewildering maze, first of theoretical mechanics, and later of Kantian metaphysics, with incidental excursions into psychology and ethics.

Taking up, in the order of presentation, the three "proofs" of vitalism, we find as the first of these the existence of what the author calls "harmonious-equipotential systems." His argument is based chiefly upon some of the well-known phenomena of "restitution"—well known, it may be added, as a result of researches in which Driesch himself has played a leading part. During the cleavage stages of certain eggs, we may remove a part—indeed any part, within rather wide limits—without interfering with the production of a normal organism. Or we may readjust and misplace the cells at will, without preventing these from becoming organized in a normal fashion. Similarly, in the case of certain adult organisms, rather low in the scale of life, a new whole will be produced from a fragment of sufficient size cut out in any plane or from any part of the body. From experiments such as these, Driesch was years ago led to his now rather celebrated declaration that the "prospective value" of a cell in a developing embryo was a "function of its position." Such a complex, in which each portion may, in emergency, be forced to play any rôle in the future development of the animal, the author terms a "harmonious-equipotential system."

After defining a "machine" as "a typical configuration of physical and of chemical constituents, by the acting of which a typical effect is attained" (Vol. I., pp. 138, 139), Driesch grants that such

a machine "might very well be the motive force of organogenesis in general, if only normal, that is to say, if only undisturbed development existed, and if a taking away of parts of our systems led to fragmental development" (p. 139). But—and here comes the proof of vitalism—"there may be a whole development out of each portion of the system—above certain limits—which is, say, of the Volume V. Good! Then there ought to exist a machine, like that which exists in the whole undisturbed system, in this portion V also, only of smaller dimensions; but it also *ought* to exist in the portion V_1 which is equal to V in amount, and also in V_2, in V_3, V_4 and so on.[4] Indeed, there do exist almost indefinitely many V_n, all of which can perform the whole morphogenesis, and all of which therefore *ought* to possess the machine. But these different portions V_n are only partially different from each other in spatial relation. Many parts of V_2 are also parts of V_1 and of V_3 and of V_4 and so on; that is to say, the different volumes V_n overlap each other successively and in such a manner that each following one exceeds the preceding one in the line by a very small amount only. But what then about our machines? Every volume which may perform morphogenesis completely must possess the machine in its totality. And now every element of one volume may play any possible elemental rôle in every other, it follows that each part of the whole harmonious system possesses any possible elemental part of the machine equally well, all parts of the system at the same time being constituents of different machines. A very strange sort of machine indeed which is the same in all its parts!" (pp. 139, 140).

"*Therefore,*" our author concludes, "*there can be neither any sort of a machine nor any sort of causality based upon constellation underlying the differentiation of harmonious-equipotential systems*" (p. 141).

No attempt will be made to meet this or the next following "proof" of vitalism until the close of this review.

The second proof of vitalism is found by Driesch in the phenomena of heredity. The aggregation of reproductive cells, in this author's terminology, constitutes a "complex-equipotential system." This type of system differs from that just considered in that, while in the "harmonious" system each part plays but a *single* rôle (the latter depending upon circumstances), in the second type *complex* acts are performed by each single element. Since the germ-cells constituting the gonad are the most complex of all in the outcome of

[4] This argument is illustrated by a diagram showing how an indefinite number of portions, of equal or of different sizes, and overlapping one another in various degrees, might be chosen from the organism.

their growth activities, the latter represents "the clearest type of a complex-equipotential system which exists."

"Could such a theory," Driesch asks us, reverting to the "machine" theory, "irrespective of all the experimental facts which contradict it—could such a theory stand before the *one* fact, that there occurs a *genesis* of that complex-equipotential system of which our one single egg forms a part? Can you imagine a very complicated machine, differing in the three dimensions of space, to be divided hundreds of times and in spite of that to remain always the same whole?" (I., p. 225).

Passing mention is made of the phenomena of hybridization, particularly to those which we know as "Mendelian." The concept of "unit characters," which has been formulated by various biologists in explanation of the Mendelian phenomena, certainly has an atomistic (*i. e.*, a mechanical) flavor. But Driesch reasons quite otherwise: "What is shown, in the first place, by these discoveries is the importance of an arranging and ruling factor in spite of all units. The organism is always one *whole,* whether the paternal properties prevail or the more complicated maternal ones; in other words, all so-called properties that consist in the *spatial relations of parts* have nothing to do with 'units' or 'allelomorphs,' which indeed can not be more than necessary means or materials, requiring to be ordered" (pp. 232, 233).

Driesch's third proof of vitalism he finds in the field of organic movement, particularly in that of intelligent action. It rests upon what he terms the principle of "individuality of correspondence" between stimulus and response.

After discussing the rôle played by human speech, in the course of which some slight difference in the sound of a single word (*i. e.*, in the auditory stimulus) may result in a totally different course of action on the part of the person addressed, while two totally different sentences, perhaps in different languages (*i. e.*, widely different stimuli), may have the same effect, he says: "There can be hardly a clearer expression of the fact that it is the *totality in its specificity,* both of the stimulus and of the effect, that comes into account in acting, and nothing else. . . . The totalities of stimulus and effect have a 'meaning,' and their meanings do not at all depend on one another piece by piece" (Vol. II., p. 71).

To this argument an air of mathematical precision is given by a schematic presentation (pp. 70, 71) which seems worth reproducing here: "Firstly, change the stimulus from $a, b, c, d, e, f, g, h, i$ into $a, b, \gamma, d, e, f, g, h, i$, and the effect may be transformed from $a_1, b_1, c_1, d_1, e_1, f_1, g_1, h_1, i_1$ into m, n, o, p, q, r, s, t.

And secondly, change the stimulus from *a, b, c, d, e, f, g, h, i* into $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa$, and the effect may *remain* $a_1, b_1, c_1, d_1, e_1, f_1, g_1, h_1, i_1$, in spite of that change.

Once more: "The dog, 'this dog,' 'my dog' is 'the same' stimulus, seen from any side or at any angle whatever: it always is recognized as 'the same,' though the actual retina image differs in every case. It is absolutely impossible to understand this fact on the assumption of any kind of preformed material recipient in the brain, corresponding to the stimulus in question, even if we intentionally neglect the fact that the material recipient would have been created *by* the stimulus in the individual's life: a recipient for the dog seen from the side would not suffice for identifying the dog from behind!" (p. 73).

An identical argument was offered tentatively (pp. 41–45) for some phenomena of instinct, although the author did not believe the case to have been wholly proved for these.

Another aspect of the same difficulty is stated somewhat later: "But it (the brain) *only* can store engrammata in the sense of given combinations of given elements, and therefore nothing but the psychical phenomena of simple recognition and of association by contiguity is immediately related to cerebral processes: it is absolutely inconceivable how the brain *qua* bodily brain could accomplish the new and free and 'logical' rearrangement of the elements of the engrammata, following the lines of individuality" (p. 98).

While any satisfactory attempt to answer this argument would lead us far into the field of psychology or of brain physiology, we may ask in passing how Driesch would account for the almost infinite complication of association paths in the human brain. Is it not here that we find the mechanism by which any element of our experience may be brought into association directly or indirectly with any other element? And how, indeed, is "meaning" to be explained except in terms of association? That several widely different stimuli, having the same meaning (*i. e.*, having certain associations in common), can bring about an identical response would seem, on the face of it, no more difficult to understand than that several very differently shaped keys can open the same lock. And conversely, that a slight difference in the stimulus (involving a change of "meaning") can bring about a complete change in the character of the response would have its parallel in the fact that a very slight modification of a key may destroy its adaptedness to one lock and render it suited to an entirely different one. These are confessedly very crude parallels, and leave out of account the almost infinite complexity of the mechanism which we are considering. But it is this complexity, we believe, and not any in-

herent impossibility, that makes a satisfactory formulation of the brain's action "absolutely inconceivable" at present.

Certain other lines of evidence are discussed by Driesch, though he makes no claim that these constitute independent proofs of vitalism. Such are the "equifinality of restitutions" and various phenomena of "adaptation," morphological and physiological. Under the first head he includes cases in which several different methods are at the disposal of the organism in its endeavor to repair itself after a given injury, the outcome, however, being the same in all cases. To the word "adaptation" he gives a much more restricted meaning than that adopted by many evolutionary writers, for he distinguishes between mere "specific adaptedness" and "adaptation." The latter term is reserved for useful responses, either structural or functional, to some external condition which is new to the organism in question.

Regarding the phenomena of selective permeability, which have frequently been urged as proofs of vitalism, since they seem to contradict the ordinary laws of osmosis and diffusion, Driesch takes a conservative position: "Nothing, indeed, is against the assumption that this organization may include factors which actually drive ions or compounds to the side of higher concentration, which indeed drive them by 'doing work,' if we like to speak in terms of energy; and these factors included in organization may very well be of a true physical or chemical nature." And here he adds an avowal of his mental attitude in approaching these questions: "We must hold to the so-called 'machine theory' of life as long as possible, we must hold it until we are really forced to give it up" (I., p. 187).

The phenomena of "immunity," however, he regards as offering far greater difficulties to the mechanistic point of view. Concerning one phase of the subject he says: "This phenomenon in particular—the production of *more* of the antitoxin or the 'precipitin' than is actually necessary—seems to render almost impossible any merely chemical theory of the facts" (I., pp. 207, 208). We may well query, however, whether such an over-production harmonizes any better with a teleological explanation.

If all these various facts are not to be explained by reference to the laws of physics and chemistry, how are we to interpret them? Driesch's answer constitutes the positive side of his teaching. His special solution is introduced tentatively, early in the course of his lectures. Its "justification" he leaves to a later stage. "Let us then borrow our terminology from Aristotle, and let that factor in life phenomena which we have shown to be a factor of true autonomy be called *entelechy*, though without identifying our doctrine with

what Aristotle meant . . . " (I., p. 144). A considerable part of the second volume is devoted to an endeavor to give this word a positive meaning.

We are told that entelechy is an "intensive manifoldness," *i. e.*, that its diversities are not temporal or spatial. Again, it "*uses* the conductive and specific faculties of the brain as a piano-player uses the piano" (II., p. 97). But entelechy, even of the sort which is responsible for intelligent actions, "has nothing of a psychical nature" (p. 138). The words "soul," "mind," and "psyche" are carefully avoided, since they would lead us into "pseudo-psychology." For Driesch, "the terms 'conscious' and 'consciousness' do not belong to that part of the Given which we call Nature; they belong to the Ego, to 'my' Ego, and to my Ego exclusively. It is not even possible to express with clearness what is meant by saying that there *'is'* consciousness in any being in Nature" (II., p. 37). For " 'being' relates to bodily movements and changes, in that sense of 'being' which is the only starting-point of all science, the sense of 'being given to my Ego' " (p. 38). Accordingly, he proposes the "very neutral name of 'Psychoid' for the elemental agent discovered in action. 'Psychoid'[5]—that is, a something which, though not a 'psyche,' can only be described in terms analogous to those of psychology"[6] (p. 82).

Now, "it is by no means difficult to get a good idea of part of the manifoldness concerned in 'psychoids' by a psychological analysis. In fact, we have merely to apply such concepts as perceiving, liking, judging, willing to a psychoid in a metaphorical manner in order to have a good *picture* of what is happening in every natural event where psychoids come into play" (II., pp. 139, 140).

But "the problem becomes very complicated as soon as we turn from the facts to the 'how,' as soon as we inquire the meaning of the primary faculties of those entelechies in which an historical basis does *not* play *any part at all.* We indeed are in a rather desperate condition with regard to the real analysis of the fundamental properties of morphogenetic, adaptive, and instinctive entelechies: for there *must* be a something in them that has an analogy not to knowing and willing in general—as it may be supposed to exist in the primary faculties of psychoids—*but to the willing of specific unexperienced realities,* and to knowing the specific means of attaining them. And we are by no means able to understand such a specified primary knowing and willing in even the slightest degree" (p. 142).

[5] It is clearly implied, though I believe nowhere explicitly stated, that the "psychoid" is to be regarded merely as a species under the genus "entelechy."

[6] In general, quotation-marks and italics are fearfully overworked by Driesch.

It is likely that the greater number both of biologists and of psychologists will agree in regarding the position of such a hypothesis as "desperate" in the extreme. In fact, it seems to represent more than anything else the weakness of the whole vitalistic position.

As has already been pointed out, "psychoids" appear to be conceived by Driesch merely as entelechies of a higher order. We are plainly told (II., p. 150) that "we may speak of an order concerning the rank of dignity of entelechies, comparable with the order of ranks or dignities in an army or administration. But all entelechies [in a given organism] have originated from the primordial one, and in *this* respect may be said to be one altogether" (p. 150). Again, after referring to "psychoids," in particular: "one might say that a higher sort of psychoid governs the main brain, a lower one the thalamus opticus, the cerebellum, the medulla, and so on," although, "it may well be true . . . that all motor entelechy is *one* and the same in one individual" (II., p. 105). In another place, on the contrary, he states that it is false to assume "that there are in space as many entelechies as there are individuals" (II., p. 317). Such passages suggest that even in the mind of Driesch himself the concept of entelechy is not without its contradictions.

Driesch is insistent in his claim that "in dealing with entelechy we are not dealing with anything psychical, or absolute or metaphysical: we are analyzing an agent at work in nature" (II., p. 259). Yet his method of characterizing this "natural" agent has at times a strong flavor of medieval scholasticism: "entelechy means the faculty of achieving a 'forma essentialis'; being and becoming are united here in a most remarkable manner: time enters into the timeless, *i. e.*, into the 'idea' in the sense of Plato" (II., p. 149).

Modern science is above all pervaded by the spirit to which, of late, the name "pragmatism" has been given. Is not this in its essence a mere insistence that when we speak we shall actually *mean* something? But what, in the presence of this touchstone, becomes of such a deliverance as that last quoted? Whether or not the whole conception of "entelechy" would not likewise dissolve into nothingness each reader must decide for himself.

Of great importance for an appreciation of Driesch's speculations are the author's attempts to define the relations of entelechy to matter and energy, on the one hand, and to mind on the other.

To begin with, he regards entelechy as in no way conflicting with the "concept of univocal determination" or with the principle "no effect without a cause." "The facts in the universe that originate in entelechy will be univocally determined as such whenever entelechy is such as it is, and entelechy is either of this or that determined kind" (II., p. 154).

"Entelechy may be aroused to manifestation by a change in bodily nature, such as is effected by fertilization or by some operation, or by some motor stimulus; and, on the other hand, entelechy may on its own part lead to changes in bodily nature" (p. 156). But entelechy is not energy: it *"lacks all the characteristics of quantity:* entelechy *is order* of relation and absolutely *nothing* else" (p. 169). It is thus not even allowable to speak of "a vital kind of energy." Such an energy "would be an energy *with differences in itself,* which is contradictory to the concept of energy" (p. 178). We may readily agree that the concept of "vital energy" has been the product of a good deal of loose thinking. Driesch has pointed out very clearly some of its weaknesses.

Much ingenuity is displayed by our author in his endeavor to avoid a conflict with the so-called laws of energetics. Entelechy, he tells us, is "unable to cause reactions between chemical compounds which never are known to react in the inorganic world. In short, entelechy is altogether *unable* to create differences of intensity of any kind.[7] But entelechy *is* able, so far as we know from the facts concerned in restitution and adaptation, to *suspend* for as long a period as it wants any one of all the reactions which are *possible* with such compounds as are present, and which would happen without entelechy. And entelechy may *regulate* this suspending of reactions now in one direction and now in the other, suspending and permitting possible becoming whenever required for its purposes" (p. 180).

"Let it be well understood: we do *not* admit that entelechy may transform potentials into actual happening by means of a so-called 'Auslösung' in any sense. Entelechy, according to our view, is quite unable to remove any kind of an 'obstacle' to happening, such as is removed in catalysis;[8] for such a removal would require energy, and entelechy is non-energetical. We only admit that entelechy may set free into actuality what it has *itself* prevented from actuality, and what it has suspended hitherto" (p. 180). And again: "Suspending the compensation of uncompensated differences of intensities among coupled kinds of energies and relaxing that suspension are in fact not acts that would require any amount of energy"[9] (p. 185).

[7] It is true that he later attributes this admission to "cautiousness" and tells us that "perhaps it will really become necessary some day to admit that entelechy not only suspends potentials, but that it creates potentials . . . and thereby creates energy" (II., p. 236).

[8] He tells us, to be sure (II., p. 187): "In the formation or activation of ferments we hypothetically see the fundamental rôle played by entelechy." These ferments are not, however, "created" by entelechy.

[9] This conception suggests, of course, the celebrated "demon" of Clerk Maxwell, and Driesch himself points out the analogy.

Whether or not such a process (*if it occurred*) would require energy, we must leave for decision to the special student of energetics. We may, however, call upon Driesch to tell us (1) whether nature offers any parallel to such a process as he has assumed; and (2) whether such a hypothesis is capable of being translated into terms of experience at all.

So far as we have been able to discover, no answer whatever is given to the first of these questions. Several attempts have, however, been made to answer the second, *i. e.*, to give us a "snap-shot" of entelechy at work. One "concrete" illustration is offered us on page 193 (Vol. II.): "A harmonious-equipotential system may consist of n cells, each of them composed of m different (chemical) constituents. In each cell every constitutent is *able* to react with every other; in other words, there exist chemical potentials or affinities between each possible pair of constituents in each cell. So far the given 'diversity of elemental composition,' kept in mere potentiality by the suspending action of entelechy. But now entelechy proceeds to actuality, and it does so by enlarging the amount of 'diversity of distribution' in the system in question: *actually* out of *all* the *possible* reactions in each cell, only *one* is allowed to *happen* and this actual reaction which determines the 'prospective value' of the cell, *is different* in each" (p. 193).

Again, after endeavoring to explain how entelechy may affect the movement of a body (though itself unable to "create" motion), he further illustrates his position as follows: "The mechanical process we have imagined is represented very clearly by an inelastic body moving with a velocity V and entering during its motion into an elastic ball. It will move into this ball for a certain time with decreasing velocity, come to rest for a moment, and then move in the opposite direction with increasing velocity again: let this process be stopped at the moment when the inelastic body has traversed say one third of the path into the elastic mass. There is no contradiction to energetics in such an event, *provided, of course, that after the suspension has ceased the mechanical and energetic events continue their course from the point where it was broken*" (pp. 220, 221).

Here, as in H. G. Wells's story of "The Man who Could Work Miracles," all the effects of one miracle are abolished by another miracle, and nature resumes her old course, leaving nobody the wiser for her temporary aberration! In the field of philosophy, "common sense" is notoriously a sort of poor relation, whose opinions no one would offer by way of serious argument. Yet it will probably be conceded that any hypothesis must at least be viewed with suspicion which offers such an affront to our habitual modes of thought.

To the reviewer there would seem to be no essential difference

between this view of Driesch's and that by which Descartes endeavored to make plausible the interaction between mind and body—*i. e.*, that mind (we may substitute entelechy) might affect the *direction* of the motion, though not its amount. But to this last view Driesch recognizes the force of the objection that "a certain amount of energy would be necessary for any 'turning' of a mass element" (II., p. 222).

Entelechy, we are told, "is affected by and acts upon spatial causality as if it came out of an ultra-spatial dimension; *it does not act in space, it acts into space;* it is not in space, it only has points of manifestation in space" (p. 235). And with commendable frankness, the author points out the analogy of this view "with some theoretical views that are advocated by so-called spiritualists."

From his proposition that "entelechy may set free into actuality what it has *itself* prevented from actuality," and nothing else, Driesch draws one curious corollary: "If entelechy always must *have done* something in order that it may do anything in the present and future, there can, of course, never be any real beginning of its acting, but this acting must be continuous. And this is what the fact of inheritance teaches us . . . a certain portion of matter that stands under the control of entelechy is handed down from generation to generation. And thus entelechy always *has* already acted!" (II., p. 181). The problem of the primary origin of life is regarded as an insoluble one (p. 262).

Driesch's conception of the relation of entelechy to mind has already been indicated in part: entelechy is totally different from mind, and yet can be understood only by the aid of an analogy with mind. His attempt to define the relation between the "psychoid" and the individual consciousness (which last was banished at an earlier stage of the discussion) carries us into an attenuated atmosphere which surely has little in common with that of the biological laboratory. After a subjective and objective analysis of the train of events which take place between an act of perception and the appropriate motor response, he is led to recognize "the most remarkable fact that certain processes which we are forced to regard as going on in my body may show a *gap* in the midst of them. . . . There is 'reality' between the two halves as far as states presented to consciousness are reality, but there is no reality between them as regards 'my body.' . . . But now there must be created some sort of *scientifically* [!] legitimate correlate to the intra-psychical series of the *subjective* point of view as advocated before. Here then we meet our old friend the *'psychoid'* again, a sort of entelechy as a natural factor" (II., p. 282).

Ordinary psycho-physical parallelism Driesch will have none of; and indeed his reasons for rejecting this doctrine are stated with clearness and force. But, "now apparently our discussion ends in a sort of parallelism again! For there can be no doubt that the immediate conscious experience of the intra-psychical series is 'parallel' to the part played by the 'psychoid' " (pp. 293, 294).

And once more (this from Driesch the metaphysician, not from Driesch the biologist): "we may say that the intra-psychical series, or briefly 'the psychical,' 'the conscious,' is parallel to, or rather an epiphenomenon of a certain metaphysical happening (unexplainable in detail, but most certainly not resembling anything mechanical, not even by analogy) which interferes with the metaphysical correlate of so-called mechanical reality" (p. 294).

Psycho-physical parallelism may or may not be an accurate description of reality. But the invariable correlation of certain states of consciousness with certain physical changes—if, at least, this correlation is regarded in a purely temporal sense—is in any case conceivable. The hypothesis is capable of translation into the commonest facts of experience. Can as much be said for this new parallelism of "psyche" and "psychoid"?

Let us now consider Driesch's attitude toward certain other of the leading problems of biology and philosophy. Early in the lecture course, after a discussion of some of the phenomena presented by a developing egg, our author concludes: "Morphogenesis, we have learned, is 'epigenesis' not only in the descriptive, but also in the theoretical sense: manifoldness in space is produced where no manifoldness was; real 'evolutio' is limited to rather insignificant topics. But was there nothing 'manifold' previous to morphogenesis? Nothing certainly of an *extensive* character, but there was something else: there was an entelechy, and thus we may provisionally call entelechy an *'intensive manifoldness.'* That then is our result: not evolutio, but epigenesis—'epigenesis vitalistica' " (I., p. 144).

At a deeper level of the analysis he is led, however, to an exact reversal of the foregoing conclusion: "moreover, any *single* spatial occurrence induced or modified by entelechy has its previous *single* correlate in a certain *single* feature of entelechy, as far as it is an intensive manifoldness . . . our assumption leads to the consequence —strange as it is—that nothing really new can happen anywhere in the universe. *All happening is 'evolutio' in the deepest meaning of the word'*"[10] (II., p. 154). And the same point of view is restated

[10] This phase of Driesch's doctrine has been ably criticized by Spaulding (*Philosophical Review*, July, 1909).

with equal emphasis on page 198: "Also in organic systems diversities are only created on the basis of preexisting diversities, even if external agents are excluded, . . . in short, differentiation is 'evolutio' in the ontological sense of the word."

It may not be fair, perhaps, to charge Driesch with any such inconsistency of thought as might be inferred from the passages quoted. That there are, however, glaring inconsistencies in his various statements regarding "evolutio" and "epigenesis" is self-evident. And this is but a single instance of a looseness of construction which pervades the whole work.

As regards the theory of "evolution" in the more modern sense of the word (not to be confused with the "evolutio" of the foregoing discussion), Driesch displays very little appreciation of the tremendous conquests which have so greatly enlarged the boundaries of our knowledge during the past fifty years. Whatever may be our estimate of "Darwinism" in the narrower and more technical sense of the word, we seldom hear a dissenting opinion as to the importance of the scientific awakening for which Darwin was in a large measure responsible.

Driesch prefers the term "theory of descent" to "evolution," since "there must be a real 'evolving' of something, in order that the word evolution may be justified verbally: and that is not the case in so-called phylogeny" (I., p. 250). The theory of descent explains the similarities among organisms, not the diversities (pp. 254, 255), hence it "leaves the problem of systematics practically where it was, and adds really nothing to its solution" (p. 256). If "so-called phylogeny . . . is based only on the pure theory of transformism, there is nothing explained at all. It was for this reason that the philosopher Liebmann complained of phylogeny that it furnishes nothing but a 'gallery of ancestors'" (p. 256). And even this "gallery," he tells us (not without justice) is largely mythical.

Passing from the theory of descent itself to the chief explanatory hypothesis, Driesch finds that natural selection is "to some degree self-evident"; but to regard it "as a positive factor in descent would be to confound the sufficient reason for the non-existence of what is not, with the sufficient reason of what is" (pp. 263, 264).

To Lamarckism Driesch grants more than do many recent evolutionary philosophers, even those of a less skeptical frame of mind. "Congenital histological adaptedness," he thinks, "may be regarded hypothetically as due to an inheritance of adaptive characters which had been acquired by the organism's activity, exerted during a great number of generations" (p. 290).

Both theories, however, are, in the opinion of our author, open

to the same fundamental objection: "the *contingency* of the typical organic form" is maintained alike by Darwinism and Lamarckism (p. 284). Thus, "Lamarckism of the dogmatic kind, as will easily be seen, only differs from Darwinism in this respect, that what according to the latter happens to the organism passively by means of selection, is according to the former performed actively by the organism by means of a 'judgment'—by the retention and handing down of chance variations" (p. 285). Thus one element "of dogmatic Lamarckism, invented with the express purpose of defeating Darwinism and taking the place of its fluctuating variability . . . is liable to just the same objections as dogmatic Darwinism itself"[11] (p. 282). For Driesch denies most strenuously "that *specific organization proper* is due to *contingent* variations, which accidentally have been found to satisfy some needs of the individual and therefore have been maintained and handed down. . . . The process of restitution, perfect the very first time it occurs, if it occurs at all, is again the classical instance against this new sort of contingency, which is assumed to be the basis of transformism. Here we see with our eyes that the organism can do more than simply perpetuate variations that have occurred at random and bear in themselves no relation whatever to any sort of unit or totality" (I., p. 286). The same opinion was offered earlier (p. 218), in especial application to the views of Jennings regarding the possible rôle of the "trial and error" principle in morphogenesis. We shall refer to this point again.

In any defense of vitalism, we naturally expect to hear much regarding "teleology." Driesch, indeed, devotes considerable space to an analysis of what is meant by organic teleology. The acts of other persons we regard as purposeful by analogy with our own acts. As regards the lower organisms, however, and of morphogenetic processes everywhere, "mere analogy would fail here to justify the application of the term, for, in fact, we can not imagine ourselves in the position of a newt repairing its foot: we are certainly unable to regenerate our own foot if it is lost in an accident, and even if our body could repair it, the process would probably go on in a so-called unconscious manner. We must then seek for a somewhat different criterion of teleology without leaving the analogy with our own acting quite out of sight" (II., pp. 131, 132).

Nor would it meet the point, he thinks, "to say that physiological

[11] This agreement of the two theories in respect to contingency was pointed out by the present reviewer in a critique of Pauly's "Darwinismus and Lamarckismus" (this JOURNAL, August 27, 1908, p. 487). It was there shown that the much-anathematized principle of selection had unconsciously been made one of the foundation stones of the Lamarckian theory, or at least of Pauly's version of that theory.

and morphogenetic processes are teleological simply because they serve to form and to preserve the organism; for this argument, taken by itself, would not imply that there is something which *ought* to be formed and preserved" (p. 132).

Driesch's own idea of what is signified by organic purposefulness is herewith presented in his own words. The reviewer regrets his inability to abstract or to simplify this statement. He regrets his inability even to understand it in any real sense. He therefore cites the original text in the hope that other readers may fare better: "Every organic process indeed, morphogenetic or physiological, is 'purposeful' for the reason that it serves to form and to preserve a specific constellation which occurs in indefinite exemplars, and whose specificity has no other reason than the existence of a previous specificity of the same type; for this reason and no other is an organic process 'teleological.' For *only on this basis* is there an analogy with phenomena to which the predicate teleological *has already been given by our previous analysis,* viz., the phenomena leading to indefinite exemplars of specific constellations called machines, or objects of art and industry in general, that is, the phenomena of human *acting*" (p. 132).

At a later point in the work, teleology and contingency are contrasted. The latter, it is said, only acquires a clear meaning when opposed to the former. In reality, of course, nothing is contingent in the sense of being undetermined; "but as to events at this very point of space and at this very moment of time, philosophy may speak of the contingency of their happening here and now, whenever it is not possible to discover anything like a wholeness or a plan to which their local and temporal appearance is due. Contingency in this sense is the same as non-teleology" (II., p. 352). "Teleology is by no means 'causality seen from behind' as many of our dogmatic philosophers maintain" (II., p. 335).

After a discussion of "harmony in nature," he tells us (II., p. 353) that the common objection to a teleological explanation "is generally a sort of enlarged Darwinism." But, "we again object on our part that this presentment of the facts is powerless to do away with the simple truth that, Givenness being what it is, one thing does occur in *favor* of the other" (p. 354). If by this our author simply means that, however produced, harmonies do exist in nature, and that they may therefore be regarded as part of a universal plan, we must grant him his right to this opinion; but such a statement is in no way incompatible with a full acceptance of Darwinism. It is but a repetition of the time-honored declaration of the up-to-date theologian that natural selection is merely the way in which the Creator creates.

Taken as a whole these lectures of Driesch's are in some measure calculated to reassure those who have feared that modern biology has shaken the foundations of faith. In fact his general attitude toward the larger theological problems, though not dogmatic, appears to be rather surprisingly conventional and orthodox.

Although his "natural science" point of view forces him to be deterministic, an analysis of freedom leads to the usual "antinomy," and he concludes with the declaration that "freedom thus escapes analysis altogether, for analysis would mean subjection to necessity" (II., p. 305). Earlier he had told us that "the common opinion about life phenomena, which of course is neither analytical nor theoretical in any sense, claims that 'I' can move my body by my 'will,' and that every living being has a so-called 'soul' by which it can do the same. This view, suggested by ordinary unscientific experience, can now be said to have been transferred from a non-analytical and non-theoretical to an analytical and theoretical sphere, and to have been proved and psychologically justified in this sphere. In fact 'I' am a link in the univocally determined series of phenomena, so far as I 'will'; my volition is both influenced and influencing" (II., p. 285).

Thus, "vitalism is the highroad to morality: morality would be an absurdity without it. . . . To a convinced theoretical materialist, to whom his neighbor is a real mechanical system, morality is an absurdity" (p. 358). The reviewer finds the marginal comment "nonsense!" opposite the foregoing passage. This was not courteous, of course, but I can not refrain from citing that first impression.

As regards a future existence, the doctrine of entelechy has nothing to say. "What science knows about death is simply this: a certain amount of matter that was formerly controlled by entelechy becomes freed from this control, and then obeys the laws of physico-chemical causality exclusively" (II., p. 262). Science ought, we are told, to deal with the so-called phenomena of spiritualism "even at the risk of finding a mere chaos of defective criticism and actual fraud; but one single fact, positively established, would well repay the hard work of generations"[12] (p. 261). In the present temper of the scientific world, even such a conservative utterance as this requires courage. We can only express our assent in principle, though willing for the present to confine our own attention to more promising fields of exploration.

The "primary entelechy in the universe" lies at the apex of Driesch's edifice. "This *primary entelechy* would not have created absolute reality, but would have ordered certain parts of it, and

[12] Driesch regards telepathy as "established beyond all doubt."

these parts, therefore, would show a sort of non-contingent constellation whilst all other constellations of the elementalities of the universe would be contingent." This, he grants, "is downright dualism."[13]

Now "in this sense of a *primary entelechy of order of constellation in the world* . . . the concept of God therefore appears as an eternal task of science; unintelligible in the last resort, as all religions maintain, and only approachable by analogies, like all absoluteness" (pp. 370, 371). Such a view "does *not* contradict the concept of God as formed by the reasoning imagination. . . . But science, and the doctrine of entelechy in particular, most strongly contradicts any form of so-called 'pantheism.' Entelechy and matter are different and external to one another throughout" (p. 372).

Whatever else may be said of Driesch's speculative writings, we can not but grant that he has rendered us a service of a high order in compelling our attention to certain very real problems in the field of biological philosophy. He has also done us an important service in forcing us to realize how very hazy and unformed are many of our ideas concerning those very mechanical principles which we so stoutly affirm to lie at the foundation of all the phenomena of life. That Driesch himself has been able to offer as an alternative anything more than a pseudo-solution of these difficulties we do not believe. His "entelechy," even though he justifies it by the creation of a new "ontological category," remains an empty name. Based upon mind as a prototype, and only intelligible by analogy with mind, it still is something utterly different from mind. It merely does the same sort of things which mind does—or rather, which it would do *if it could,* for in reality, we are told, mind can do nothing at all. Only the "psychoid," the "natural" even though utterly inconceivable factor, can really act. How much simpler the panpsychic type of vitalism represented by Pauly! For him no necessity for a third unimaginable mode of existence: nothing but concrete acts of perception, judgment and will.[14] Driesch's oft-reiterated assertion that entelechy is a "natural" factor does not help his case in the least. From the major premise

[13] The same dualism is thus expressed with relation to the organic sphere: "even in the only field where dynamically effective individuality is known to us—in the biological individual—this individuality seems not to be concerned in the minutest details: the *single cells* of a tissue are *not* as such a really *essential* constituent of organization" (p. 367). Again: individuality (= entelechy) "interferes—or has interfered—with causality here and there, but not everywhere" (p. 368).

[14] It is true that Pauly does not consistently live up to this standard, but lapses at times into the purest mysticism.

"everything that is is natural" may be deduced the "naturalness" of any figment of the imagination whatever. Have we not all listened to a similar justification of belief in miracles, not to speak of that latter-day witchcraft which, under various names, still flourishes in our midst?

Driesch expresses his "firm conviction that we can not avoid the admission of vitalistic autonomic agents possessing no experience . . . and yet endowed with *specific* knowing and willing." There must be something, in other words, which *foresees* (if, indeed, unconsciously) the end to be attained, and directs the organism toward its attainment. No piece of mechanism imaginable, he believes, could explain the phenomena in question.

The issue here involved is certainly a fundamental one. It is another phase of the same problem which confronted Darwin: how are "teleological" results to be explained without the need of invoking final causes? For, whether we consider the life of a race or of an individual organism, phenomena constantly come to view which *seem* like the manifestations of conscious purpose directed toward a definite goal. As is familiar to all, Darwin's special contribution to the subject lay in his formulation of the principle of natural selection, *i. e.*, the perpetuation of favorable variations, which were conceived of as "accidental" in the sense of being unrelated to the end to be attained.

Darwin's hypothesis has been subjected to a most searching criticism, and the general verdict seems to be that it is not in itself a sufficient account of the motive principle underlying organic evolution. But it is significant that every real causal explanation of evolution which has compelled serious attention has embodied, at least implicitly, the selective principle. "Mutation" needs selection in order to explain advance. Without it, we should have to fall back upon some postulate of "orthogenesis," which, of course, has no explanatory value at all, but is merely the restatement of our problem. The same may be said of the various attempts to account for evolution by "isolation." Even Lamarckism, which has figured historically chiefly as a rival theory, and an alternative to natural selection, is, in last analysis, based upon the selective principle.[15] For unless we assume some inscrutable foreknowledge on the part of the organism (or its entelechy), as does Driesch, we must suppose that the responses of the latter are in the first instance random and non-adaptive. There is a survival (*i. e.*, retention by the organism) of these responses which satisfy a given need, and these are fixed in the race through heredity.

In fact, it would seem impossible to frame any purely mechanical

[15] As has already been pointed out above (p. 322).

(*i. e.*, non-teleological) explanation of those structures and functions which we call "purposeful" without postulating a selection of some sort. And the materials for this selection must, in the first instance, have been "contingent" in the sense of not having been determined in their nature by the need to be satisfied. The only alternative would seem to be a revival of the "special creation" hypothesis under a new name and a mysticism fatal to any further advance along these lines.

Jennings has recently extended his "trial and error" hypothesis (*i. e.*, selection in its purest form) to the problems of organic regulation. According to this view, based originally upon the reactions of infusoria to stimuli, any interference or disturbance in the physiological processes of the organism "causes a change of behavior and varied movements, subjecting the organism to many different conditions. One of these conditions relieves the interference with the internal processes, so that the changes in behavior cease."[16] Thus, if we behold merely the end results of this process, we may readily be led to believe that the organism actually *seeks* favorable conditions and *avoids* unfavorable ones. Now, if we substitute "metabolism" or "processes of growth" for the word "behavior" in the foregoing formula, we arrive at a conception which may be applicable to various processes of restitution and form-regulation. This application of his principle Jennings himself has not hesitated to make, though in a tentative way.

Mention must here be made of another hypothesis, in no sense contradictory to the foregoing, although emphasizing a different aspect of the problem. It is of interest as an attempt to formulate in some detail the mechanical working out of certain processes which have furnished some of the chief arguments for vitalism. In an extremely suggestive and ingenious paper,[17] S. J. Holmes has called to his aid the analogy of symbiosis, in an attempt to explain the close interrelation and interdependence of the various parts of the body. "The harmonious functioning of an organism," he believes, "is mainly secured by a system of automatically acting checks which we may conceive to act in a manner more or less remotely analogous to the governor of a steam-engine or the forces which regulate the motions of the planets. . . . In these cases deviation from the normal is the cause which automatically sets up activities by which the normal is regained." So too, "the self-regulation of organisms may . . . be in a measure understood if we assume that their parts stand in a relation of mutual dependence such that the undue growth or functioning of any part is held in check by the reactions thus

[16] "Behavior of the Lower Organisms," p. 343.

[17] "Archiv für Entwickelungsmechanik der Organismen," 1904, Bd. XVII.

brought about by other, and especially the contiguous structures. If we suppose that the various cells constituting the body have each a different kind of metabolism, and that the products of each cell are in some way utilized by the neighboring cells, so that each derives an advantage from the particular association in which it occurs, we may understand, in a measure, how this checking may be brought about." And here an analogy is pointed out with the relations which obtain in "symbiotic" communities, such as those composed of animal cells and certain unicellular algæ.

The cases of functional hypertrophy among higher animals are completely in harmony with such a conception. "Removal of one kidney causes an increased growth in the other kidney in response to the greater demand upon its activity. . . . The connection of these cases of functional hypertrophy with regeneration is intimate. Remove one of a pair of organs and its fellow increases in size. Remove a part of one of these organs and the remaining portion grows, forms new tissue, and regenerates the missing part." That such a process may be conceived of in chemical terms is suggested by some of the phenomena of "chemical equilibration." "The decomposition of compounds in solution proceeds until there is a definite relation established between the amounts of the old compounds and the new. If the chemical equilibration thus established is disturbed by the removal of one of these compounds more of that compound will be produced; and the more rapidly the compound is removed the more rapidly it is formed."

This hypothesis of Holmes's is closely related to that of Jennings (as Jennings himself has been quick to point out), though no explicit reference is made by the former to "trial and error." At one point, however, we are told that "cells which develop in the direction of the missing part receive those advantages which the symbiotic relation afforded the cells whose place they take. Differentiation in any other direction deprives them of these advantages and subjects them to other unfavorable conditions." The author avows his adoption of Roux's principle of the "struggle of the parts," though in a modified form. "We have conceived the parts of an organism to be engaged in a struggle for existence, but, as the parts are mutually dependent, the struggle leads to an adjustment to a norm instead of the elimination of some parts and the survival of others." Thus, although there is no selection of elementary parts for survival, there is assumed a furtherance of those activities of each which conform to the needs of the whole and a checking of those activities which do not conform to these needs.[18]

[18] It is true that something more is assumed than the selection of *contingent variations* in the activities of the parts; but the conception is none the less mechanical throughout.

Holmes has obviously given us a mere sketch of a theory of form-regulation, as was indeed inevitable in the present state of our knowledge. I have dwelt upon it here at such length, inasmuch as it undoubtedly helps us to conceive in physicochemical terms certain phenomena which have long been the mainstay of vitalism. We can not say as much of the various references to crystal formation and other analogies with inorganic nature which have so frequently been offered in rebuttal.

Now it must be remembered that Driesch himself, in a passage already cited, has recognized and endeavored to meet the class of explanations which we have just discussed. "The process of restitution, perfect the very first time it occurs, . . . is the classical instance against this new sort of contingency. . . . Here we see with our own eyes that the organism can do more than simply perpetuate variations which have occurred at random." What we see with our own eyes, it may be replied, is only a series of visible stages in the process of restitution. We *do not* see the inmost morphogenetic processes, physical and chemical, by which this end is attained. How do we know that each step has not been, as Jennings suggests, the outcome of much blind groping on the part of the living units concerned? In the case of certain physiological "regulations" Jennings has pointed out that there is some evidence for such a process of gradual adaptation. It is quite possible, therefore, that in this particular instance, Driesch has raised an issue which we may put to experimental test. For any indication of a profiting by "experience," *i. e.*, of a shortening of the time required to effect a given regulative response, would harmonize well with the hypothesis that the response was at first effected through tentative steps.

As regards the phenomena of "intelligent" action, it is quite certain that the principle of selection (trial and error) may be applied with illuminating results. This has been pointed out by Bütschli,[19] in his well-known critique of vitalism, and indeed the idea is rather a fundamental one in psychology. We must remember that the vitalist projects his own conception of "purposeful" human conduct backward throughout the whole realm of organic activity. Is it not possible that a more accurate analysis of the actual development of rational behavior in the human individual would have led to a very different conception of organic purposefulness?

In conclusion, it may be well to add that I do not regard the mechanical views here advocated as being in any sense more "materialistic" than those of Driesch. While the dualistic interpolation of non-physical causes in the physical chain of events has been de-

[19] "Mechanismus und Vitalismus," Leipzig, 1901.

nied, nothing has been said in any way inconsistent either with a thoroughgoing idealism of this, that, or the other variety, or with the doctrine of psychophysical parallelism. These concepts, however, belong to metaphysics rather than to biology, and I believe that the issues raised by the vitalists may be met without having recourse to them.

FRANCIS B. SUMNER.

NAPLES ZOOLOGICAL STATION.

REVIEWS AND ABSTRACTS OF LITERATURE

The Right to Believe. ELEANOR HARRIS ROWLAND. Boston and New York: Houghton Mifflin Co. 1909.

Miss Rowland's book is an examination into the claims of religious belief to acceptance on the part of those who wish to believe all that is intellectually permissible, but nothing more. The book consists of six chapters and a short introduction. The introduction defines the object of the book; the first chapter defends the rationality of adopting religion as a working hypothesis while its truth is under discussion, and defines religion in a general way; the remaining chapters are devoted to a detailed account of the author's religious beliefs and to an attempt to establish their claims not only to be used as experimental working hypotheses, but to be accepted as truths: their right to belief.

What the book really contains is a religious creed for unimaginative persons desirous of being supplied with one, together with an argument for bringing their conflicting reason and desire into harmony.

As the title suggests, William James's religious philosophy forms the theoretical basis, and apparently also the practical inspiration of this little book, which seems indeed to have caught a breath of his spirit. In style it is direct, concise, and colloquial, and therefore eminently readable for the layman, for whom, among others, it is meant. It contains many keen and well-put observations on life and living, and is interesting in the sense in which all books presenting the personal experience of a lively mind are interesting. Its value as a contribution to religious philosophy, or, if it disclaim such a classification, to thought about religion, appears to me to be slight, and for the following reasons.

The argument, we are told, is addressed, not to the emotional believer or unbeliever, but to the mind which demands reasons for its affirmations and negations, and has in this case found none. It is to this doubter that the religious hypothesis is recommended as a working hypothesis, until grounds for its rational acceptance shall have been found; the practical grounds for its adoption in the interim lying solely in the greater satisfaction afforded from the ethical point of view, and evidenced by "general assent" (page 11). The doubting reader is inclined to let this argument pass unchallenged, first because to him, who by definition is asking for proofs, the practical attitude is uninteresting, and second, because religion, not having been defined, is still sufficiently vague to

lack even the amount of materiality necessary to permit it to conflict with anything else, or to produce any concrete results, satisfactory or otherwise. No sooner, however, has the reader, for the sake of continuing the argument, agreed to give the religious hypothesis the chance of proving the best working hypothesis, than religion is defined as "essentially" comprising five affirmations: the existence of God, the divinity of Christ, the freedom of man, the efficacy of prayer, and the immortality of the soul. The doubter, who has more or less reluctantly accepted his own religious ideal as a temporary guest, now finds himself embarrassed by a form of Christianity which, in the name of the author, refuses to be dislodged until its host shall have "disproved" the five affirmations in which it consists.

Here is truly an extraordinary situation. A perfectly arbitrary definition of religion has been made, this religion has been asserted on the authority of a few persons to be a "satisfactory" view of the world; this burden, and in addition to it the burden of proof, has been shifted to the shoulders of the poor reader, if he wishes to "disbelieve." As he is still "doubting," however, he turns hopefully to the next chapter, in which the author has promised to establish not only his opportunities, but also his right to believe.

Here he is confronted with the first religious affirmation, the existence of God (who is conceived as a disembodied personality, whose motive in creation was the desire for ultimate companionship), and is again challenged to "disprove" it. The author, undertaking to do so for the reader, shows that there is no evidence of either a sensational or a deductive character, that is, no *proof* in support of God's existence. She concludes, however, that as absence of proof is not disproof, and as, unless you disprove a statement you have no logical right to disbelieve it, you must now admit that God's existence has at least half a chance of being true. But, continues the author, if you have failed to find proof or disproof for religion, you have done something decisive in its favor, nevertheless; you have placed it outside the sphere of scientific treatment altogether; you have protected it once for all from the chance of being affected by scientific results; religion and science are now seen to be running on separate tracks. In this position outside the influence of science, the author finds much company for religion; laws of nature, ultimate concepts, and even such fundamental facts as other minds, the self, and the connection between mind and body, are cited as analogies, as mysteries without sense-evidence or logical necessity. "Our acceptance of God's existence depends, as does our belief in the real personalities of others and of ourself, on our desire to so believe where proof is impossible" (p. 41).

It would seem unnecessary to do more than present such statements in order to exhibit their falsity, but for the sake of clearness let it be said that the laws of nature are affected by scientific results, are tested and verified by sense experience, and are not only within the pale of science, but constitute the instruments with which science operates; that ultimate concepts are, even when not definable in other terms, arrived at by logical processes from the fountain head of perceptual experience; that

personality in self and others is a fact of experience or derived from such fact, as is also the connection of mind and body, and that it is in the interpretation of such experiences only that theories differ; and lastly, that even if the foregoing were not the case and there were no sense-evidence in favor of any of these beliefs, they would, nevertheless, form no analogies to religious belief inasmuch as they are held as matters of knowledge, and are dealt with by methodological and philosophical theory as matters of real or potential knowledge, to be clarified, interpreted, and tested by their relations of other facts and their scientific systematization. It remains the unique achievement of the author's religious "thinker" to have removed all knowledge not sensational in character from the sphere and influence of scientific method, to call it "faith" and run it along parallel tracks; in short, to split the world in twain and feel comfortable in it. "Now faith is the substance of things hoped for, the evidence of things not seen," says the book, "and the crux of the whole situation is, what do we hope for?" (p. 42). And yet it appears that after all it is not sufficient to hope for a thing in order to assert its reality, for when about to embark on a voyage of discovery of the nature of our hopes, the author once more undertakes to determine what kind of *evidence* would weigh the balances in favor of the existence of religious facts, and whether such evidence obtains. Finally, after following through many intricacies, the goal of this whole inquiry, the right to believe, is reached, and the evidence for the validity of religious affirmations is located. It is termed "qualitative" evidence, and consists in the God-experience of the "high" and "valuable" witness in his most "significant" and "best" moments. If such a man, provided he be otherwise normal, testifies to holding communion with a disembodied but real personality (God) and getting responses from him, who can contradict him, says our author (p. 52).

Thus it is the religious experience (feeling and its interpretation) on the part of the highest type of normal men of "all" generations that vouches for the existence of God, and for the other religious facts. As, however, no standards of evaluation are given by the author there obtains no necessary connection between highness or goodness and the form of religion here held; the connection remains accidental and permits us to give the same credence to the experiences of a good Buddhist, a good Atheist or a good Mystic as to those of a good Christian. Rare references are indeed made to what "the world as a whole" or "all religions" have "apparently" wanted, but they are based on no historical considerations whatever, and in the remaining chapters the point of view taken is explicitly that of the "average person's" and implicitly that of the Christian's religious demands. That "evidence" such as this establishes neither the actual universality nor the ideal validity of the author's religious beliefs must be obvious. One needs but to reflect that from the quantitative point of view the evidence to-day would be against and not for any form of Christianity; and that from a qualitative point of view, unless we make the test of a man's "value" consist in his faith in these particular tenets—which would beg the question—there have been and are

to-day innumerable good, great, and significant men, poets, artists, philosophers, founders of religion, heroes of one sort or another, who have believed otherwise, or not at all. The stream of time has flowed past the Christian era, past Spinoza and his age, Voltaire and his, to our own day encouraged and inspirited by such thinkers as Nietzsche, Ibsen, Maeterlinck, and Key.

The right bestowed by this book on the doubter searching for light, is his right not only to his individual religious sentiment, but to an individual interpretation of this sentiment in conformity with his individual hopes, and independent of scientific methods or results.

E. STETTHEIMER.

NEW YORK.

JOURNALS AND NEW BOOKS

REVUE PHILOSOPHIQUE. April, 1910. *Une félida artificielle (1^er^ article)* (pp. 329–357): P. JANET. – An interesting account of a case of hysterical anorexia lasting seventeen years and involving modifications of the personality. *La mort et l'immortalité d'après les données de la biologie* (pp. 358–380): DR. JANKÉLÉVITCH. – Biological considerations serve to show us, not the utility of death, but the uselessness of immortality. *L'existence et le fondement des lois du hasard* (pp. 381–401): RICHARD-FOY. – The terms "probable," "improbable," "almost certain" correspond to essentially metaphysical notions that spring from some mysterious instinct in man. *Influence de l'habitude sur les sentiments* (pp. 402–412): E. MARTIN. – A study of the relation of the two principles, (1) that feelings are weakened through exercise and (2) that feelings tend to create an increased sensibility to feeling by repetition. *Analyses et comptes rendus.* N. Losskÿ, *Die Grundlegung des Intuitivismus:* M. SOLOVINE. Garfein-Garski, *Ein neuer Versuch über das Wesen der Philosophie:* G.-H. LUQUET. Dr. J. Petersen, *Kausalität, Determinismus und Fatalismus:* DR. S. JANKÉLÉVITCH. Dr. Ludwig Stein, *Dualismus oder monismus?:* G.-H. LUQUET. Dr. A. Rausch, *Elemente der Philosophie:* G.-H. LUQUET. J. J. von Biervliet, *La Psychologie quantitative:* DR. J. PHILIPPE. M. Oeffner, *Das Gedächtniss:* L. POINTEVIN. Pierre Duhem, *Étude sur Léonard de Vinci:* L. ARRÉAT. Arthur Collier, *Clavis Universalis:* M. SOLOVINE. B. Spaventa, *La Filosofia Italiana nelle sue relazioni con la Filosofia Europea:* J. PÉRÈS. E. Bodrero, *Eraclito:* C. HUIT. N. Hartmann, *Platos Logik des Seins:* C. HUIT. Albert Görland, *Aristoteles und Kant bezüglich der Idee der theoretischen Erkenntnis:* C. HUIT. J. M. Baldwin, *Darwin and the Humanities:* G.-L. DUPRAT. *Revue des périodiques étrangers.*

REVUE DE METAPHYSIQUE ET DE MORALE. March, 1910. *Hasard ou Liberté?* (pp. 137–146): E. BOUTROUX. – A defense of contingency and freedom. The fourth lecture of the series recently delivered at Harvard University. *L'objectivité du principe de Carnot* (pp. 147–179): B. BRUNHES. – A careful statement of the meaning of the principle

of degradation of energy and the antinomy apparently existing between it and the mechanical theory of heat. A reply is included to certain criticisms of Le Dantec. *Il y a fayots et fagots* (pp. 180–184): F. LE DANTEC. – A frank acceptance of Brunhes's corrections that distinguishes two meanings of the principle of the degradation of energy: (1) the principle of the fall of temperature, (2) the principle of the diffusion of diffusible energy. *F. Rauch: sa psychologie de la Connaissance et de l'Action* (pp. 185–218): H. DAUDIN. – An appreciative study of this writer's work. *Études critiques. "Devoir," par B. Jacob:* L. WEBER. *Variétés. Pour la Bibliographie philosophique:* TH. RUYSSEN. *Questions practiques. Le procès de la Démocratie:* GUY-GRAND. *Supplément.*

Berkeley, Hastings. Mysticism in Modern Mathematics. New York, London, Edinburgh, Toronto, Melbourne: Henry Frowde, Oxford University Press. 1910. Pp. xii + 264. 8 s.

Bosanquet, Bernard. The Philosophical Theory of the State (Second Edition). London: Macmillan and Co. 1910. Pp. xl + 342.

Charmont, J. La Renaissance du Droit Naturel. Montpelier: Coulet et Fils; Paris: Masson et Cie. 1910. Pp. 218.

Dewing, Arthur Stone. Life as Reality. A Philosophical Essay. New York, London, Bombay, and Calcutta: Longmans, Green, & Co. 1910. Pp. x + 214. $1.25.

Jones, Henry. The Working Faith of the Social Reformer, and other Essays. London: Macmillan & Co. 1910. Pp. xii + 305.

Levy-Bruhl, L. Les fonctions mentales dans les sociétés inférieures. Paris: F. Alcan. 1910. Pp. 461.

Pichler, Hans. Ueber Christian Wolffs Ontologie. Leipzig: Durr'sche Buchhandlung. 1910. Pp. 91.

Sorley, W. R. The Interpretation of Evolution (British Academy Proceedings). London: Henry Frowde. 1910. Pp. 32.

The Works of Aristotle, translated into English, J. A. Smith and W. D. Ross, Editors. "De Mirabilibus Auscultationibus," Lawrence D. Dowdall. Oxford: The Clarendon Press. 1909.

Von Uexküll, J. Umwelt und Innenwelt der Tiere. Berlin: J. Springer. 1909. Pp. 259. M. 7.

Walker, Leslie J. Theories of Knowledge. Absolutism, Pragmatism, Realism. New York, London, Bombay, and Calcutta: Longmans, Greene, & Co. 1910. Pp. xxxix + 696. $2.75.

NOTES AND NEWS

BELOW are the names of the members of the Southern Society for Philosophy and Psychology, for 1910. The names of members of the Council are marked by an asterisk. The year in which the term expires is given in parenthesis.

Bailey, Superintendent T. P., Memphis City Schools, Memphis, Tenn.

Baird, Professor J. W., Clark University, Worcester, Mass.
*('10) Baldwin, Dr. J. M., 116, avenue Matignon, Paris, France.
Barnes, Professor J. C., Maryville College, Maryville, Tenn.
Benedict, President Mark K., Institute for Women, Sweet Briar, Va.
Bierly, Professor H. E., University of Chattanooga, Chattanooga, Tenn.
Brooks, Professor E. C., Trinity College, Durham, N. C.
*Buchner, Professor E. F., Johns Hopkins University, Baltimore, Md. (President).
Burrow, Dr. N. T., Johns Hopkins University, Baltimore, Md.
Carré, Professor H. B., Vanderbilt University, Nashville, Tenn.
Coffey, Professor A. B., University of Louisiana, Baton Rouge, La.
Day, Professor F. L., Randolph-Macon College, Ashland, Va.
Dresslar, Professor F. B., University of Alabama, University, Ala.
Dubray, Professor C. A., Marist College, Washington, D. C.
Dunlap, Dr. K., Johns Hopkins University, Baltimore, Md.
Eby, Professor F., Baylor University, Waco, Texas.
*('11) Ellis, Professor A. C., University of Texas, Austin, Texas.
Fant, Professor Anne, Mississippi State Industrial Institute, Columbus, Miss.
Farrar, Dr. C. B., Sheppard-Pratt Hospital, Towson, Md.
*Franz, Dr. S. I., Government Hospital for the Insane, Washington, D. C (Vice-President).
Furry, Dr. W. D., Johns Hopkins University, Baltimore, Md.
Gault, Mr. R. H., Northwestern University, Evanston, Ill.
Griffin, Professor E. H., Johns Hopkins University, Baltimore, Md.
Gwinn, Professor J. M., Tulane University, New Orleans, La.
*('10) Halleck, Mr. R. P., Boys' High School, Louisville, Ky.
Hornstein, Mr. F., 1008 Fourth Street, Boone, Iowa.
Harrison, Professor J. G., Mercer University, Macon, Ga.
*('11) Hill, Professor D. S., Peabody Normal College, Nashville, Tenn.
Hodge, Professor F. A., State Female Normal School, Farmville, Va.
Johnson, Professor P., Bethany College, Bethany, W. Va.
Jones, Professor E. E., University of Indiana, Bloomington, Ind.
Keen, Mr. J. H., University of Texas, Austin, Texas.
King, President C. B., Elizabeth College, Charlotte, N. C.
Ladd-Franklin, Mrs. Christine, 527 Cathedral Parkway, New York.
Lane, Professor W. B., Randolph-Macon Woman's College, Lynchburg, Va.
Lefevre, Professor Albert, University of Virginia, Charlottesville, Va.
McAllister, Professor C. N., State Normal School, Warrensburg, Mo.
Martin, Mr. M. A., Richmond, Va.
Messenger, Professor J. F., University of Vermont, Burlington, Vt.
Meyer, Professor Max, University of Missouri, Columbia, Mo.
Mezes, President S. E., University of Texas, Austin, Texas.
Monroe, President ——, North Carolina Medical College, Charlotte, N. C.
Moore, Professor G. B., University of South Carolina, Columbia, S. C.
Morse, Professor Josiah, Peabody Normal College, Nashville, Tenn.
Ogden, Professor R. M., University of Tennessee, Knoxville, Tenn. (Secretary and Treasurer).

Pace, Professor E. A., Catholic University of America, Washington, D. C.
Parrish, Professor Celestia S., State Normal School, Athens, Ga.
*('12) Payne, Professor Bruce R., University of Virginia, Charlottesville, Va.
*('12) Pearce, President H. J., Brenau College, Gainesville, Ga.
Purinton, President D. B., University of West Virginia, Morgantown, W. Va.
Rall, Dr. E. E., University of Texas, Austin, Texas.
Raymond, Professor G. L., George Washington University, Washington, D. C.
Richardson, Dr. E. E., 406 Seventh Street, S. W., Washington, D. C.
Ruediger, Professor W. C., George Washington University, Washington, D. C.
Sauvage, Professor G. M., Holy Cross Colleges, Washington, D. C.
Schmidt, Dr. Karl, Pequaket, N. H.
Shanahan, Professor E. T., Catholic University of America, Washington, D. C.
Sheppard, Dr. W. T., 511 G Street, Washington, D. C.
Smith, Professor S., Hampden-Sidney College, Virginia.
Smith, Professor W. B., Tulane University, New Orleans, La.
Steele, Professor N. M., Furman University, Greeneville, S. C.
Sterritt, Professor J. MacB., George Washington University, Washington, D. C.
Sutherland, Dr. A. H., University of Illinois, Urbana, Ill.
Wardlaw, Professor Patterson, University of South Carolina, Columbia, S. C.
Watson, Professor J. B., Johns Hopkins University, Baltimore, Md.
Williams, Mr. T. A., 1758 K Street, Washington, D. C.
Woofter, Professor T. J., University of Georgia, Athens, Ga.
Yoakum, Dr. C. S., University of Texas, Austin, Texas.

Mr. B. R. Simpson, of the department of psychology and education, Brooklyn Training School for Teachers, will engage in summer school work in the University of Georgia this summer. Mr. Simpson will offer two courses, one in "Educational Psychology" and one in "Principles of Education."

Professor Lloyd Morgan, for twenty-two years Principal of University College, Bristol, Eng., and now Professor of Psychology and Ethics in the University of Bristol, has been presented with a quantity of plate and books in recognition of his services to higher education.

Mr. L. W. Cole, formerly professor of psychology in the University of Oklahoma, more recently instructor in psychology in Wellesley College, has been appointed professor of psychology in the University of Colorado.

Macmillan and Company announce Professor J. G. Frazer's "Totemism and Exogamy" in four volumes.

Dr. Noah Knowles Davis, professor emeritus of philosophy in the University of Virginia, has died at the age of eighty years.